

REMARKS

Claims 1 through 9 and 11 were pending in this Application. Applicant acknowledges, with appreciation, the Examiner's indication that claim 5 contains allowable subject matter.

Claims 1 and 11 have been amended to correct typographical errors. Claim 9 has been amended to depend from claim 8. Care has been exercised to avoid the introduction of new matter. Adequate descriptive support for the present Amendment should be apparent throughout the originally filed disclosure as, for example, the depicted embodiments and related discussion thereof in the written description of the specification, including page 10, line 3. Applicant submits that the present Amendment does not generate any new matter issue. Entry of the present Amendment is respectfully solicited. It is believed that this response places this application in condition for allowance.

Applicants submit this Amendment, together with the new arguments submitted below are a proper submission under 37 C.F.R. § 1.114 and place the application in condition for allowance. In the event the Examiner rejects one or more of the pending claims, a final rejection on first action would be premature and improper.

Claims 1, 3-4, 6-8 and 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over DiGiovanni et al. (U.S. Pat. No. 6,504,973, hereinafter "DiGiovanni") in view of Akasaka et al. (U.S. Pat. No. 6,292,288, hereinafter "Akasaka"). This rejection is traversed.

Dependent claim 2 was rejected under 35 U.S.C. § 103 for obviousness predicated upon DiGiovanni in view of Akasaka and further in view of Bolshtyansky et al. (U.S. Pat. No. 6,456,426, hereinafter "Bolshtyansky"). This rejection is traversed.

Dependent claim 9 was rejected under 35 U.S.C. § 103 for obviousness predicated upon DiGiovanni in view of Akasaka and further in view of Tsuzaki (Broadband Discrete Fiber Raman

Amplifier with High Differential Gain Operating Over 1.65 $\mu$ m-band (2000)). This rejection is traversed.

Independent claim 1 defines a Raman amplification pump module. The Raman amplification pump module outputs pump light for Raman amplification of signal light propagating through an optical waveguide path and the Raman amplification pump module does not include an optical waveguide path through which signal light propagates. In DiGiovanni, signals propagate through dispersion compensating fiber (DCF) 114. See FIG. 1. Contrary to the Examiner's assertion on page 2 of the Office action, DCF 114 cannot be considered as a nonlinear medium, as required in claim 1. The nonlinear medium required in claim 1 is a part of a Raman amplification pump module and signal light does not propagate through the nonlinear medium.

A Raman amplification pump module according to the present claimed subject matter should be compared with pump 116 in DiGiovanni. In addition, a coupler located by a signal output end 118 in DiGiovanni should be compared with a multiplexing module 16 in the present application and should not compared with the optical multiplexer as recited in claim 1, line 8.

Neither DiGiovanni, Akasaka nor Teuzaki discloses or remotely suggests a nonlinear medium as required in independent claim 1. The nonlinear medium in claim 1 is a part of a Raman amplification pump module and signal light does not propagate through the nonlinear medium. Accordingly, even if the references are combined as suggested by the Examiner, the claimed subject matter as a whole is not taught. Accordingly, the rejections under 35 U.S.C. § 103 for obviousness are not legally viable for at least this reason.

If any independent claim (claim 1) is non-obvious under 35 U.S.C. § 103(a), then any claim depending therefrom (claims 2-4, 6-9 and 11) is non-obvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Moreover, the separate patentability of claim 4 is advocated. At page 3 of the Office action, the Examiner asserted that element 130 of DiGiovanni corresponds to the multi-wavelength light source of claim 4. However, grating 130 in DiGiovanni is merely a reflector (column 6, line 55) and is not a light source as the term is known and used in the art.

Based upon the foregoing it should be apparent that even if the applied references are combined as proposed by the Examiner, and Applicant does not agree that the requisite fact-based motivation has been established, the claimed invention would not result. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988). Applicant, therefore, submits that the imposed rejections under 35 U.S.C. § 103 for obviousness are not factually or legally viable and, hence, solicits withdrawal thereof.

Claims 9 was rejected under the first paragraph of 35 U.S.C. § 112 for lack of adequate enabling support. In the statement of rejection the Examiner simply identified that there is no upper-limit on the ratio for  $\gamma/\alpha$  and asserted that Applicant has not enabled “all figures greater than  $13 \text{ W}^{-1}\text{dB}^{-1}$ ”. This rejection is traversed.

Initially, Applicants state that to their knowledge, recently in the field of technology relating to the present application (which includes a numerical limitation with respect to characteristics of an optical fiber or quality of fiber optic communication), a number of patents including U.S. Pat. Nos. 7,006,742 and 7,113,326 have issued. While these patents have an open-ended claim, that is, the numerical limitation is set forth only at one end of a possible

range, while the limitation of the other end is unspecified, so long as the patent description includes an example of embodiment with respect to the open-ended claim.

It seems that in the examination procedures of such patent applications, no questions were raised as to the region of enablement with respect to such unspecified end values (0 or  $\infty$ ). No person of ordinary skill in the art would consider practicing an invention at such an extreme region of an unspecified end. If a claim should be regarded as being impractical simply because the claim has a numerical limitation only at one end of a range, with no numerical limitation at the other end, the conclusion resulting therefrom would be that a patent cannot be allowed for a useful invention including such a claim, even in the case where it has a technically significant numerical limitation at the one end. As such, no inventor/applicant would be willing to file a patent application for such an invention even if it is a valuable one. Is this a situation desired by the USPTO?

Moreover, is it not sufficient if an apparently practicable example is disclosed in the specification with respect to a claim having such an open ended value? If a claim apparently includes an implementable case, the claim should be considered to satisfy the enablement requirement, even in the case where the claim is considered to include an impracticable open ended value. In order to characterize a preferred embodiment of an invention in comparison with a conventional technology, it is often the case that a limitation is specified only at one end of a range in a claim. In such cases, will none of claims having an open-end of a range be allowed for lack of enablement? It would be appreciated if a standard is given by which a claimed patent may or may not be allowed without a question of enablement being raised in the above-mentioned case. Otherwise, the applicant cannot but reiterate these arguments in the future.

In the present application, “ $\gamma / \alpha = 25 \text{ W}^{-1} \text{ dB}^{-1}$ ” is given in the description as an example for “ $\gamma / \alpha$  is not less than  $13 \text{ W}^{-1} \text{ dB}^{-1}$ ”, which is specified in claim 9. The subject of claim 9 is a Raman amplification pump module, and not an optical fiber (nonlinear medium). Therefore, even if an optical fiber should include an unpractical case of  $\gamma / \alpha$ , that is,  $\infty$ , for example, it does not mean that claim 9 lacks enablement as such. In other words, one of ordinary skill in this art would understand that a Raman amplification pump module, as claimed in the present patent application, can be obtained if the Raman amplification pump module is made by using an optical fiber which is capable of use under the condition where  $\gamma / \alpha$  is not less than  $13 \text{ W}^{-1} \text{ dB}^{-1}$ . Thus, this is a matter which a person of ordinary skill in the art can easily understand and foresee as being practicable.

Applicants further submit that, the Examiner improperly adopted a per se rule for lack of enablement. However, lack of enablement under the first paragraph of 35 U.S.C. § 112 is a question of law. *U.S. Steel Corp. v. Philips Petroleum Co.*, 865 F.2d 1247, 9 USPQ2D 1461 (Fed. Cir. 1989); *U.S. v. Telectronics Inc.*, 857 F.2d 778, 8 USPQ2d 1217 (Fed. Cir. 1988). In rejecting a claim under the first paragraph of 35 U.S.C. § 112 for lack of adequate enabling support, it is incumbent upon the Examiner to establish a basis in fact and/or cogent technical reasoning to support the ultimate legal conclusion that one having ordinary skill in the art would not be able to practice the claimed invention, armed with the supporting specification, without undue experimentation. *In re Cortright*, 165 F.3d 1353, 49 USPQ2d 1464 (Fed. Cir. 1999); *In re Brana*, 51 F.2d 1560, 34 USPQ2d 1436 (Fed. Cir. 1995); *In re Marzocchi*, 439 F.2d 220, 169 USPQ 367 (CCPA 1971). Applicant emphasizes that a patent disclosure is directed to one having ordinary skills in the art. *In re Howarth*, 654 F.2d 103, 210 USPQ 589 (CCPA 1981). Moreover, and quite significantly, it has been repeatedly held that the scope of enablement varies

inversely with the degree of predictability in the art, i.e., enablement is a function of the complexity of the involved subject matter. *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 15 USPQ2d 1321 (Fed. Cir. 1990); *U.S. v. Teletronics Inc.*, *supra*. Applicant stresses that a patent specification is presumed enabling in the absence of a reason to doubt the objective truth of the statements contained therein. *In re Cortright*, *supra*; *In re Brana*, *supra*; *In re Marzocchi*, *supra*.

In applying the above legal tenets to the exigencies of this case, particularly the judicial presumption of enablement, Applicant submits that the Examiner did not establish a *prima facie* basis to deny patentability to the claimed invention under the first paragraph of 35 U.S.C. § 112 for lack of adequate enabling support. Specifically, the Examiner has not overcome the presumption of enablement, as by advancing technological reasoning to doubt the statements in the specification, or by establishing that the claimed invention is inherently unbelievable or involves implausible scientific principles. *In re Cortright*, *supra*. Rather, the Examiner simply points to the absence of an upper limit, as though one having ordinary skill in the art would have theoretically envisioned any upper limit would be applicable, and then announced the legal conclusion of lack of enablement under the first paragraph of 35 U.S.C. § 112.

Applicant submits that given the guidance in the present disclosure, one having ordinary skill in the art would have recognized an operable ratio, certainly without undue experimentation. On this issue, the Examiner's reference to Chen Ho article (2001) does not constitute technological evidence sufficient cast doubt to the statements in the present specification, much less establish that the claimed invention is inherently unbelievable or involves implausible scientific principles. Applicant submits that the Examiner has not overcome the presumption of enablement and, hence, has not established a *prima facie* basis to deny

patentability to the claimed invention under the first paragraph of 35 U.S.C. § 112 for lack of adequate enabling support.

Applicant is not asserting that all of the values, including infinite, where  $\gamma/\alpha$  is not less than  $13 \text{ W}^{-1}\text{dB}^{-1}$  are practical. A person skilled in the art naturally understands a nonlinear medium having  $\gamma/\alpha$  of infinite cannot be realized. It is submitted that claim 9 defines a preferred property of an optical fiber (a nonlinear medium) according to the present invention. Applicants direct the Examiner's attention to issued U.S. Patent Nos. 7,006,742 and 7,118, 326, noting in particular, claim 1 (non linear coefficient equal to or more than  $10 \text{ W}^{-1} \text{ km}^{-1}$ ) of the '742 patent and claims 1 and 9 of the '326 patent (non linear coefficient not less than  $10/\text{W}/\text{km}$ ). These issued patents are presumed enabled and do not recite upper limits.

Applicant, therefore, submits that the imposed rejection of claim 9 under the first paragraph of 35 U.S.C. § 112 for lack of adequate enabling support is not legally viable and, hence, solicits withdrawal thereof.

Claim 9 was rejected under the second paragraph of 35 U.S.C. § 112. In the statement of rejection the Examiner asserted that the claim range lacks an upper limit and relies essentially on the same rationale in the rejection under the first paragraph of 35 U.S.C. § 112. This rejection is traversed.

The Examiner, again, improperly adopted a per se rule to reject the claims. However, indefiniteness under the second paragraph of 35 U.S.C. § 112 is a **question of law**, not a litmus test. *Personalized Media Communications LLC v. U.S. International Trade Commission*, 161 F.3d 696, 48 USPQ2d 1880 (Fed. Cir. 1998); *Tillotson, Ltd v. Wlaboro Corp.*, 831 F.2d 1033, 4 USPQ2d 1450 (Fed. Cir. 1987); *Orthokinetics Inc. v. Safety Travel Chairs Inc.*, 806 F.2d 1565, 1 USPQ2d 1081 (Fed. Cir. 1986). Accordingly, in rejecting a claim under the second paragraph of

35 U.S.C. § 112, the Examiner must provide a basis in fact and/or cogent technical reasoning to support the ultimate legal conclusion that one having ordinary skill in the art, with the supporting specification in hand, would not be able to reasonably ascertain the scope of protection defined by a claim. *In re Okuzawa*, 537 F.2d 545, 190 USPQ 464 (CCPA 1976). Significantly, consistent judicial precedents holds that **reasonable precision** in light of the particular subject matter involved is all that is required by the second paragraph of 35 U.S.C. § 112. *Zoltek Corp. v. United States*, 48 Fed. Cl. 240, 57 USPQ2d 1257 (Fed. Cl. 2000); *Miles Laboratories, Inc. v. Shandon, Inc.*, 997 F.2d 870, 27 USPQ2d 1123 (Fed. Cir. 1993); *North American Vaccine, Inc., v. American Cyanamid Co.*, 7 F.3d 1571, 28 USPA2d 1333 (Fed. Cir. 1993); *U.S. v. Teletronics Inc.*, 857 F.2d 778, 8 USPQ2d 1217 (Fed. Cir. 1988); *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 231 USPQ (Fed. Cir. 1986). Applicant stresses that claims must be interpreted as one having ordinary skill in the art would have interpreted the claims in light of and consistent with the supporting specification. *Zoltek Corp. v. United States, supra*; *Miles Laboratories, Inc. v. Shandon, Inc., supra*.

In applying the above legal tenets to the exigencies of the case, Applicant submits that the Examiner did not discharge the initial burden of establishing a prima facie basis to deny patentability to the claimed invention under the second paragraph of 35 U.S.C. § 112. Specifically, there is **no litmus test** triggering the ultimate legal conclusion of indefiniteness under the second paragraph of 35 U.S.C. § 112 because an **open range** appears in a claim. Merely because some claim language may not be precise does not automatically result in indefiniteness under the second paragraph of 35 U.S.C. § 112. *Seattle Box Co., Inc. v. Indus Crating & Parking, Inc.*, 731 F.2d 818, 826, 221 USPQ 568 (Fed. Cir. 1984). Indeed, the use of relative expressions has been sanctioned in numerous judicial decisions. See, for example,



*Andrew Corp. v. Gabriel Electronics, Inc.*, 847 F.2d 819, 6 USPQ2d 2010 (Fed. Cir. 1988).

**Precision should not be equated with quantification.** Rather, the degree of precision required is a function of the subject matter. *Miles Laboratories, Inc. v. Shandon, Inc.*, *supra*. In this respect, Applicant would point out that claims can only be held indefinite if reasonable efforts at claim interpretation prove futile, and that the claim is insolubly ambiguous with no narrowing construction proper regardless of how formable a task it is to understand the claim. *Exxon Research & Eng'g., Co. v. United States*, 265 F.3d 1371, 1375, 60 USPQ2d 1272 (Fed. Cir. 2001). *See also Invitrogen Corp. v. Biocrest Manufacturing L.P.*, 424 F.3d 1374, 76 USPQ2d 1741 (Fed. Cir. 2005).

With the above legal tenets in mind Applicant submits that one having ordinary skill in the art would have had no difficulty understanding the scope of claim 9, particularly when reasonably interpreted in light of and consistent with the written description of the specification, which is the judicial standard. *Miles Laboratories, Inc. v. Shandon, Inc.*, *supra*. Applicant, therefore, submits that the imposed rejection of claim 9 under the second paragraph of 35 U.S.C. § 112 is not legally viable and, hence, solicits withdrawal thereof.

It is believed that all pending claims are now in condition for allowance. Applicant therefore respectfully requests an early and favorable reconsideration and allowance of this application. If there are any outstanding issues which might be resolved by an interview or an Examiner's amendment, the Examiner is invited to call Applicant's representative at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper,

**Application No.: 10/699,846**

including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "Brian K. Seidleck".

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